

AND JULIA EVANS
BY KATIE SYLOR-MILLER



<https://danggit.com>
love this?

RECIPES FOR GETTING OUT OF A GIT MESS

DANGIT, GIT!



what's this?

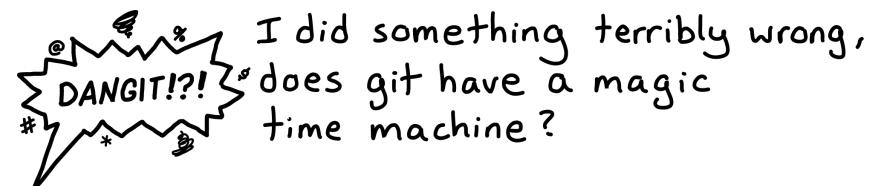
If you find git confusing, don't worry! You're not alone. People who've been using it every day for years still make mistakes and aren't sure how to fix them. A lot of git commands are confusingly named (why do you create new branches with `git checkout`?) and there are 20 million different ways to do everything.



This zine explains some git fundamentals in plain English, and how to fix a lot of common git mistakes.



By Katie Sylor-Miller & Julia Evans
Website: <https://ohshitgit.com>
Cover art by Deise Lino



Yes! It's called `git reflog` and it logs every single thing you do with git so that you can always go back.

Suppose you ran these git commands:

```
git checkout my-cool-branch ①
git commit -am "add cool feature" ②
git rebase master ③
```

Here's what `git reflog`'s output would look like. It shows the most recent actions first:

```
:  
245fc8d HEAD@{2} rebase -i (start):③checkout master  
b623930 HEAD@{3} commit: ②add cool feature  
01d7933 HEAD@{4} checkout: ①moving from master  
to my-cool-branch:  
:
```

If you really regret that rebase and want to go back, here's how:

```
git reset --hard b623930
```

```
git reset --hard HEAD@{3}
```

2 ways to refer to that commit before the rebase

magic time machine?
I did something terribly wrong, does git have a
I want to undo something from 5 commits ago!
I want to split my commit into 2 commits!
I rebased and now I have 1,000 conflicts to fix!
I committed a file that should be ignored!
I have a merge conflict!
I tried to run a diff but nothing happened!
I accidentally committed to the wrong branch!
I committed but I need to make one small change!
I need to change the message on my last commit!
.....

* git mistakes & how to fix them *

8 mistakes you can't fix
7 HEAD is the commit you have checked out
6 a branch is a reference to a commit
5 every commit has a parent commit
4 a SHA is always the same code
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DANGIT!! I want to undo something from 5 commits ago!

If you made a mistake but want to keep all of the commits since then, git revert is your friend!

git revert will create a reverse patch for the changes in a commit and add it as a new commit.

① Find the commit SHA for the commit you

want to undo

② Run:

③ After a commit message for the revert commit

Now all of the changes you made in that commit are undone!

This is super useful if you push a bad commit to a shared repository and need to undo it!



git revert SHA

.....

A SHA always refers to the same code

Let's start with some fundamentals! If you understand the basics about how git works, it's WAY easier to fix mistakes. So let's explain what a git commit is!

Every git commit has an id like 3f29abcd233fa, also called a SHA ("Secure Hash Algorithm"). A SHA refers to both:

- the changes that were made in that commit see them with 'git show'
- a snapshot of the code after that commit was made

No matter how many weird things you do with git, checking out a SHA will always give you the exact same code. It's like saving your game so that you can go back if you die! You can check out a commit like this:

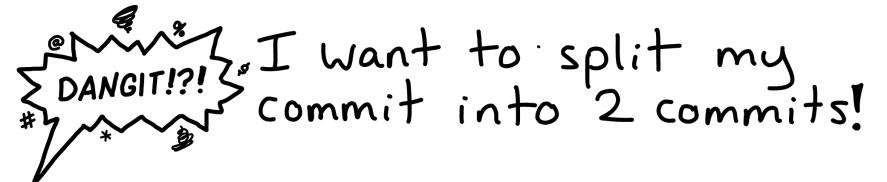
git checkout 3f29ab

SHAs are long
but you can just use the first 6 chars

This makes it way easier to recover from mistakes!



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- ① Stash any uncommitted changes (so they don't get mixed up with the changes from the commit)

git stash

- ② Undo your most recent commit

git reset HEAD^

↑
safe: this points your branch at the parent commit but doesn't change any files

- ③ Use git add to pick and choose which files you want to commit and make your new commits!

- ④ Get your uncommitted changes back

git stash pop



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A branch is a pointer
to a commit

\$ cat .git/refs/heads/master

Here's some proof! In your favourite git repo, run
this command:

fix-fybo ↳ qaqaqa

awesame-feature ↳ 3bafeaa
master ↳ 2effab

A branch in git is a pointer to a commit SHA

Understanding what a branch is will make it WAY EASIER
to fix your branches when they're broken: you just need
to figure out how to get your branch to point at the right
commit again!

3 main ways to change the commit a branch points to:

- * git commit will point the branch at the new commit
- * git push will point the branch at the same commit as the remote branch
- * git reset COMMIT_SHA will point the branch at the branch at COMMIT_SHA

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branches with many conflicting commits, you can just merge!
alternatively, if you have 2

git rebase master

④ Rebase on master
git rebase -i SHA_YOU_FOUND
goes here
output of git merge-base

③ Squash all the commits in your branch together

git merge-base master my-branch

② Find the commit where your branch diverged
from master

git rebase --abort

① Escape the rebase of doom

This can happen when you're rebasing many
commits at once.

I started rebasing and
conflicts to fix!
DANGIT!! now I have 100000000

HEAD is the commit you have checked out

In git you always have some commit checked out. HEAD is a pointer to that commit and you'll see HEAD used a lot in this zine. Like a branch, HEAD is just a text file.

Run `cat git/HEAD` to see the current HEAD.

Here are a couple of examples of how to use HEAD:

show the diff for the current commit:

```
git show HEAD
```

UNDO UNDO UNDO UNDO: reset branch to 16 commits ago ↴

```
git reset --hard HEAD~16
```

HEAD~16 means
16 commits ago

show what's changed since 6 commits ago:

```
git diff HEAD~6
```

squash a bunch of commits together

```
git rebase -i HEAD~8
```

Rebasing a branch against itself & commits
ago lets you squash commits together!
(use "fixup")



I committed a file that
should be ignored!

Did you accidentally commit a 1.5GB file along
with the files you actually wanted to commit?
We've all done it.

① Remove the file from Git's index

```
git rm --cached FILENAME
```

This is safe: it won't delete the file

② Amend your last commit

```
git commit --amend
```

③ (optional) Edit your .gitignore so it doesn't
happen again



now your coworkers won't be stuck
downloading a HUGE git commit

Every commit (except the first one) has a parent commit. You can think of your git history as looking like this:

```

graph TD
    current["current HEAD abcde"] --> parent["parent HEAD feefee"]
    parent --> grandParent["grand-parent HEAD a92eab"]
    grandParent --> b29aff["initial commit b29aff"]

```

HEAD always refers to the current commit you have checked out, and HEAD⁺ is its parent. So if you want to go look at the code from the previous commit, you can run

git checkout HEAD⁺

commits don't always have
1 parent: merge commits
actually have 2 parents!



HEAD always refers to the current commit you have checked out, and HEAD⁺ is its parent. So if you want to go look at the code from the previous commit, you can run

"initial commit"
b29aff
:
a92eab HEAD "fix +jpa"
parent HEAD "add cats"
grand-parent HEAD a92eab
current HEAD abcde HEAD "make cats blue"

every commit has a parent

Meld (meldmerge.org) is a great choice!
Resolve conflicts with 'git merge-tool!'.
You can use a GUI to visually



- ④ git commit when you're done → --commit=edit
- ③ git diff --check: check for more conflicts
- ② git add the fixed files
- ① Edit the files to fix the conflict

To resolve the conflict:

```

<<<<< HEAD
    if x == 0:
        return false
    if y == 6:
        return true
    else:
        code from master
        code from branch
    >>>>> D34367

```

Something like this in the files with conflicts:

Suppose you had master checked out and ran

I have a merge conflict?
DANGIT???

mistakes you can't fix

Most mistakes you make with git can be fixed. If you've ever committed your code, you can get it back. That's what the rest of this zine is about!

Here are the dangerous git commands: the ones that throw away uncommitted work.



`git reset --hard COMMIT`

- ① Throws away uncommitted changes
- ② Points current branch at COMMIT

Very useful, but be careful to commit first if you don't want to lose your changes



`git clean`

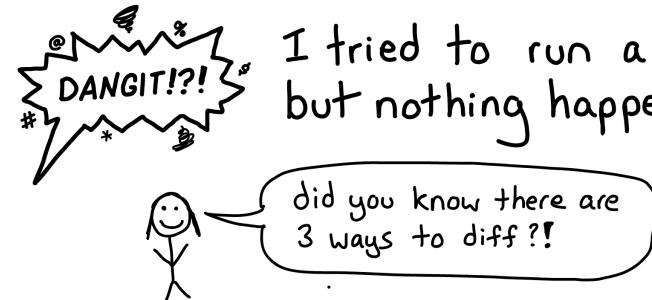
Deletes files that aren't tracked by Git.



`git checkout BRANCH FILE`

or directory

Replaces FILE with the version from BRANCH.
Will overwrite uncommitted changes.



Suppose you've edited 2 files:

\$ git status

On branch master

Changes to be committed: staged changes

modified: staged.txt

(added with
'git add')

Changes not staged for commit:

modified: unstaged.txt

unstaged
changes

Here are the 3 ways git can show you a diff for these changes:

→ `git diff: unstaged changes`

→ `git diff --staged: staged changes`

→ `git diff HEAD: staged+unstaged changes`

A couple more diff tricks:

→ `git diff --stat` gives you a summary of which files were changed & number of added/deleted lines

→ `git diff --check` checks for merge conflict markers & whitespace errors

If you run `git commit`, but change your mind, you can always abort by deleting the commit message if saving + quitting.



`git checkout -b`, also checks out the branch create a new branch. The difference is `git branch`, and `git checkout -b`, both

`git commit --amend` will replace the old commit with a new commit with a new SHA, so you can always go back to the old version if you really need to.

Then edit the commit message & save!

`git commit --amend`

No problem! Just run:

I need to change the message on my last commit!
DANGER!!

`git branch my-new-branch`

② Create the new branch

`git checkout master`

① Make sure you have master checked out

DANGER!! master that should have been on a brand new branch!

I committed something to





I committed but I need to make one small change!

- ① Make your change
- ② Add your files with git add
- ③ Run:

```
git commit --amend --no-edit
```



this usually happens to me when I forgot to run tests/ linters before committing!

You can also add a new commit and use git rebase -i to squash them but this is about a million times faster.



I accidentally committed to the wrong branch!

- ① Check out the correct branch

```
git checkout correct-branch
```



cherry-pick makes a new commit with the same changes as *, but a different parent

- ② Add the commit you wanted to it

```
git cherry-pick COMMIT_ID
```



↑
use 'git log wrong-branch'
to find this

- ③ Delete the commit from the wrong branch

```
git checkout wrong-branch  
git reset --hard HEAD^
```



be careful when running 'git reset --hard'
I always run 'git status' first to make sure there aren't uncommitted changes and 'git stash' to save them if there are